

What is claimed is:

1. A method for displaying full spectrum electronic images with increased color gamut without the use of filters, comprising:
 - 5 a) a full spectrum light source
 - b) an adjustable diffraction grating.
2. A method according to claim 1 where the adjustable grating is programmable.
- 10 3. A method according to claim 1 where the light source is a femto-second laser.
4. A method according to claim 2 where the programmable grating provides a programmable bandwidth function.
- 15 5. A method according to claim 2 where the programmable grating provides a programmable blaze angle function.
6. A method for displaying full spectrum images wherein the spectral content of the image is fully programmable.
- 20 7. A method according to claim 6 wherein the spectral content of the image is provided by a programmable grating.
8. A method according to claim 6 wherein the light source is a femto-second laser.
- 25 9. A method according to claim 6 wherein the spectral content of the image matches the color perceptual characteristics of the human visual system.
- 30 10. A method according to claim 6 wherein the programmable grating is adjustable in real time.

11. An apparatus to provide full spectrum images consisting of:

- a) a full-spectrum light source;
- b) a programmable diffraction grating;
- c) a scanning mirror;
- d) a reflection system controllable on a pixel by pixel basis

12. An apparatus according to claim 11 wherein the light source is a femto-second laser.

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13. An apparatus according to claim 11 wherein the reflection system is a digital micro-mirror device.

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14. An apparatus according to claim 11 wherein the scanning mirror is a multisided, front-surface mirror vibrating in synchronism with the frame rate.

15. An apparatus to provide full spectrum images incorporating a programmable grating.

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16. An apparatus according to claim 17 wherein the grating is electrically deformable.

17. An apparatus according to claim 18 wherein the grating is affixed to an electrically deformable substrate.

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18. An apparatus according to claim 17 wherein the grating is magnetically deformable.

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19. An apparatus according to claim 20 wherein the grating is mounted to a magnetically deformable substrate.

20. An apparatus according to claim 17 wherein the grating's deformable dimensions are controlled by a computer program.